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ABSTRACT

Three research studies investigated student involvement in teacher education. "Belief System Change in Student Teachers" was designed to investigate the possible changes that occur within the belief systems of student teachers, in particular, changes in values, Machiavellianism, authoritarianism, and dogmatism. Generalized social psychological measures were employed to eliminate one individual rating or perceiving another. The second study, "Assessing a Teacher Education Program," assessed the needs perceived by prospective teachers. The study considered choice of vocation, quality of the teacher preparation program, student teaching experience, and suggested improvements. The final study, "A Study of the Verbal Behavior of Creative and Less Creative English and Social Studies Student Teachers," was concerned with a) differences in verbal behavior between student teachers rated creative and those rated less creative, b) differences in pupils' verbal initiative and response to these groups, c) differences in learning activities employed by the two groups, and d) differences in selected personal and professional characteristics between the two groups. (JA)

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BELIEF SYSTEM CHANGE IN STUDENT TEACHERS

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ASSESSING A TEACHER EDUCATION PROGRAM

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A STUDY OF THE VERBAL BEHAVIOR OF CREATIVE AND LESS CREATIVE ENGLISH AND SOCIAL STUDIES STUDENT TEACHERS

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FOREWORD

Several years ago the Association of Teacher Educators instituted a program feature at the annual meeting devoted to research in teacher education, with presentations made by young graduate students in honor of Dr. Florence B. Stratemeyer. Many members who felt that the printed monographs were a valuable addition to the ATE publications program will be pleased with the reappearance of selected studies.

The Research Committee, under the leadership of Dr. Robert Schuck, planned the first research night at the 1973 annual meeting. The two papers selected for presentation at that time are included in this bulletin.

The first paper is on changes in student teachers' belief systems as determined by social psychological measures. Jack and Theodore Greenstein's findings and discussion will interest those perplexed by changes in student teacher values and attitudes.

In the second study, I. V. Ahnell and R. K. Templeton present a means for evaluating a teacher education program by the graduates of that program. This will have appeal to those interested in assessing student needs for ideas that can be relevant to program modification.

Finally, Margaret Ishler offers some interesting findings about the creativity of English and social studies student teachers and behaviors that appear to identify the more creative and the less creative.

Special acknowledgment goes to Dr. Robert Flanders and his subcommittee on Research Studies, the group responsible for soliciting, evaluating, and recommending the research papers included in this bulletin.

Chandler Barbour, Chairman
ATE Communications Committee

JACK GREENSTEIN
THEODORE GREENSTEIN

BELIEF SYSTEM CHANGE IN STUDENT TEACHERS[1]

The recent shift in the job market picture for the newly graduated education major has encouraged teacher preparation institutions to be more critical of the effects of the student teaching experience. Traditionally, such evaluation has been attempted using standardized teacher competency scales. However, use of such measures may give an incomplete or even misleading assessment of the laboratory experience, due in part to the subjective nature of these measures.

To avoid this pitfall, the authors have chosen to examine the effects of the student teaching experience employing generalized social psychological measures which eliminate the necessity for one individual (i.e., the supervising teacher) to rate or perceive another (i.e., the student teacher).

Central Michigan University's teacher preparation program places the student with a supervising teacher at the appropriate level and in the proper subject area for approximately sixteen weeks, during which time the student assumes an increasingly greater degree of responsibility for the class. After an appropriate period of time, the student teacher has accepted virtually all of the regular teacher's responsibilities: planning, classroom management, evaluation, and so on.

It is not unreasonable to assume that this is an extremely important period in the life of the student teacher. His career may well depend on his performance during the student teaching experience. More important, the process of confronting the student's own conceptions of the educational process and the role of the teacher with the realities and demands of actual teaching may have a profound influence upon the student.

The present study was designed to investigate the possible changes that occur within the belief systems of student teachers, in particular, changes in values, Machiavellianism, authoritarianism, and dogmatism.

[1] The research reported herein was made possible in part through a grant from the Research and Creative Endeavor Committee, Central Michigan University. The authors wish to acknowledge the cooperation of the following CMU staff members: Dr. Barbara Bissot, Dr. Alan Ellsberg, Dr. Paul Federoff, Dr. Harold Huber, Dr. Lois Redmond, Dr. Frank Stancato, and Dr. Lyman Van Winkle.

VALUES AND VALUE SYSTEMS

Rokeach (13) states that "a *value* is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite mode of conduct or end-state of existence." Each individual's values are organized into a value system—"an enduring organization of beliefs along a continuum of relative importance concerning preferable modes of conduct or end-states of existence."

To Rokeach, values are the fundamental unit of an individual's conceptual framework through which he evaluates and makes comparisons and on which he bases his decisions. "A person's value system may thus be said to represent a learned organization of rules for making choices and for resolving conflicts—between two or more modes of behavior or between two or more end-states of existence" (9:161). All human beings possess, to a greater or lesser extent, the same values. The primary distinction between value systems is the relative importance placed on the particular values.

The instrument Rokeach designed to measure values is called the Value Survey (12). It contains two lists of eighteen values each: *terminal* values such as *a comfortable life, a world at peace*, and *inner harmony*, which represent end-states of existence; and instrumental values such as *courageous, clean* and *honest*, or modes of conduct. The value names (along with short defining phrases) are printed on gummed labels and the respondent is asked to rank them "in order of their importance to YOU, as guiding principles in YOUR life."

Rokeach and others have done extensive research relating the Value Survey to a wide range of demographic (4,5,9), attitudinal (9,10,11), and behavioral (10) factors, both in correlational and long-range studies. In general, the Value Survey seems to be both a reliable and a valid measure of values and value systems.

VALUES AND ATTITUDES

Rokeach (9) has pointed out that the tremendous number of studies of attitude change and structure have resulted in a superficial and sometimes contradictory knowledge of attitudes but have not led to any satisfactory conception of the role of these attitudes in determining behavior. He therefore proposes that the primary focus of social psychology should be the concept of value. He argues that values are a more powerful and efficient explanatory concept than attitudes, because (a) values are more fundamental components of the individual's belief system; (b) values are determinants of attitudes as well as of behavior; (c) there are relatively few different values and

these values are organized hierarchically into value systems, while attitudes are relatively numerous and unorganized; and (d) values are more dynamically related to overt behavior.

Rokeach (10) has demonstrated the apparent validity of these points in his own research. Through a brief experimental treatment aimed at presenting the subject with information showing his attitudes and values to be inconsistent, he has induced attitudinal, value, and behavioral change in college students that is still significantly present as long as twenty-one months afterward.

The implications of Rokeach's value and attitude change work for education and educators are obvious. If educators can select certain attitudes and values they deem important, it seems possible that they might be able to induce change in their students in teacher training programs in the direction of emphasizing these particular values and attitudes.

MACHIAVELLIANISM

Christie and Geis (3) define *Machiavellianism* as a tendency to manipulate others. They point out (a) that the manipulator is not concerned with morality in the conventional sense, (b) that he is basically "cool" in interpersonal relationships, and (c) that ideological persuasion is not related to manipulative tendency since those who manipulate are primarily concerned with means rather than ends. Items in the Machiavellian, or "Mach," scale are drawn chiefly from Machiavelli's *The Prince* and *The Discourses* and made relevant to contemporary society when necessary.

A variety of interesting correlative research using the Mach scale has been reported. Singer (17) found a positive relationship between Mach scores and grade point averages for male college freshmen; Back, (cited in Christie and Geis, 3), found that medical students planning to specialize in psychiatry were significantly more Machiavellian than those interested in surgery. Milbrath (also cited in Christie and Geis) observed that Washington lobbyists who served more than one client scored higher on the Mach scale than those who had only one client.

To summarize these and other findings (3), it appears that "the greater the involvement of an individual in a complex of formalized role relationships with others, the greater the endorsement of manipulative tactics"; that high scorers on the Mach scale "seem to have greater success in meeting the demands of American society"; and that in laboratory situations, college students "succeeded in out-manipulating their partners roughly in proportion to their agreement with Machiavellian precepts."

What are the implications of Machiavellian or manipulative behavior to education? Clearly, the teaching situation is one which often suggests or even demands manipulative tactics. Any number of plausible predictions concerning Machiavellianism and teaching present themselves for investigation. We might hypothesize that teachers are more manipulative than the general population and that the student teacher would learn to use manipulative behaviors in order to succeed in managing his classroom.

AUTHORITARIANISM

Perhaps no other single work in the field of social psychology has stimulated so much discussion and research as *The Authoritarian Personality*, by Adorno and others (1). Kirscht and Dillehay (6), list several hundred books and articles concerned with the problems presented and investigated by the California group.

Research on the authoritarian syndrome suggests that individuals possessing fascistic or prefascistic tendencies can be identified by certain cognitive and behavioral manifestations, among them a rigid adherence to conventional mores and ethics along with a tendency to reject and punish those who violate these mores and ethics; a generalized hostility and cynicism in the individual; a predisposition to identify with authority- and power-figures; and an opposition to the subjective, imaginative, or tender-minded side of life.

A good deal of research has been done in an attempt to relate authoritarianism, or the F-scale, as the instrument constructed to measure this variable is known, to various aspects of education, and the results are far from conclusive. Shaver and Richards (15) cite several articles. Interestingly, the authors of the Minnesota Teacher Attitude Inventory (4) indicate that the authoritarian personality has been generally accepted as an operational definition of the "poor teacher."

DOGMATISM

The Dogmatism scale was formulated by Rokeach (8) as an answer to the methodological and theoretical questions created by the F-scale. Basically, the Dogmatism (D) scale was designed as a measure of *general* authoritarianism as opposed to authoritarianism of the political right, which the F-scale apparently is tapping.

Rokeach views cognitive belief systems as having three major dimensions: a belief-disbelief dimension, a central-peripheral dimension, and a time perspective dimension. An "open" cognitive system is one in which belief and disbelief systems are not greatly isolated

from each other, in which there is a relatively small degree of differentiation between belief and disbelief systems, and in which there is a relatively high level of differentiation within the disbelief system. Central, or primitive, beliefs concerning the world in general are usually favorable; concern with authority is more with the message than the source from which it emanates. Finally, the open-minded person possesses a relatively broad time perspective.

Contrast the above with the closed system, which rejects disbelief systems relatively strongly, which has a high degree of isolation between and within belief and disbelief systems, and in which there is a relatively low level of differentiation within differing disbelief systems. Primitive beliefs are often threatening or unfavorable; concern with the source of messages from authority overrides that of the content of the messages. Closed-minded persons usually present a relatively narrow future-oriented time perspective.

Rokeach summarizes these factors, stating that there is one basic characteristic by which we may judge whether an individual's cognitive system is open or closed: "the extent to which the person can receive, evaluate, and act on relevant information received from the outside on its own intrinsic merits, unencumbered by irrelevant factors in the situation arising from within the person or from the outside" (8:57). It would appear that open-mindedness is important to the teaching process, both in a theoretical and in an operational sense.

SUMMARY

Given these four measurements of belief system structure and content—values, Machiavellianism, authoritarianism, and dogmatism—how does the student teacher change, if at all, during the course of his first teaching experience? Is there a cohesive pattern or framework to the changes within his belief system? The present research was designed as an explorative study to tentatively measure belief system change in student teachers as a result of their student teaching experience. If, for example, educators (cf. 4) feel that the "good" teacher should not be authoritarian, do our teacher training programs in fact teach our students to be less authoritarian and more egalitarian?

Education has traditionally emphasized open-mindedness. Is this concern mirrored in our teacher preparation programs? Or is it merely given lip service and swept aside when the day-to-day realities of training educators are met?

Are there certain values that are deemed desirable for teachers to emphasize? If so, what are they? Can we modify the relative

importance that student teachers place upon these particular values and induce them to deemphasize other, less desirable values?

These are just a few of the questions the present research was designed to study. In general, studies of teacher training programs have concentrated on comparing the relative effectiveness of two different types of programs, using standardized teacher attitude tests as measurement criteria. We have attempted a rather different approach. Instead of using such scales as the Minnesota Teacher Attitude Inventory, which limits itself to questions of purely educational concern, we have employed standard social psychological measures in order to assess a wider range of belief system factors than is usual in educational research. As an added bonus, we gain the ability to compare our results for student teachers on these scales with norms obtained by other researchers on samples varying in socioeconomic status and other demographic variables.

METHOD

Subjects. A total of 173 Central Michigan University elementary and secondary education majors participated in the study. These were divided into two groups: a control group of 56 education majors enrolled in a required education course at the Mt. Pleasant campus, and an experimental group of 117 elementary and secondary education majors involved in their student teaching experience. Fifty-nine of the latter group were assigned by the director of student teaching to CMU's Southeastern Michigan Student Teaching Center, while the remaining 58 were placed at the Flint Center. These assignments are generally made without regard to academic record or other achievement, the main consideration being the proximity of the student's home to his assigned teaching center.

None of the subjects in the control group had participated in the student teaching program. As far as was practical, the two groups were equivalent save for the experimental treatment under study—the student teaching experience.

A total of 19 students were dropped from the analyses due to incomplete questionnaires: 3 in the control group, 6 from the Southeastern Center, and 10 from the Flint Center.

Instruments. The California F-scale, forced-choice short form (2), was employed to measure authoritarianism. The Rokeach Value Survey, Form E (12), was used to assess values and value systems. The Mach IV scale (3) was used to give a measure of Machiavellian or manipulative tendencies; the Dogmatism scale, 20-item short form (18), was given to measure open-mindedness.

Procedure. Students in the on-campus (control) group were given the four instruments along with questions concerning basic demographics by their instructor in the required educati[illegible] at pretest and posttest. Off-campus (experimental) stu[illegible]mpleted the questionnaires in groups of 15-30 each, supervised by their center's coordinator. Complete anonymity of responses was assured in all cases; it was emphasized that none of the information on the questionnaires would go into the students' records.

The following order of presentation was used both at pre- and posttest: demographics, Value Survey, F-scale, and Dogmatism and Mach IV scales. These last two scales were combined in the questionnaires since they both were scored in a seven-point Likert format.

The pretest was administered to both experimental and control subjects at the beginning of the semester, prior to the actual involvement of the student teacher in teaching responsibilities. Posttest questionnaires were administered to both groups approximately sixteen weeks later, at the end of the teaching experience. Both pretest and posttest questionnaires were given over a one-week span.

RESULTS

Originally, the design of this study called for separate analyses of data from the two different teaching centers. However, the results are so similar that they have been pooled for all analyses.

Pretest data. Table 1 shows pretest means for experimental and control groups of F, D, and Mach. All pretest differences were tested

TABLE 1.—PRETEST MEANS ON AUTHORITARIANISM (F), DOGMATISM (D), AND MACHIAVELLIANISM (MACH) FOR EXPERIMENTAL AND CONTROL GROUPS

		N	$\bar{x}$	s.d.	t[1]	p
F	Experimental	116	36.08	2.02	1.19	ns
	Control	56	36.87	2.71		
D	Experimental	116	65.75	12.39	1.47	ns
	Control	55	62.76	12.24		
Mach	Experimental	116	89.10	11.79	1.65	ns
	Control	55	85.73	13.63		

[1] t-test for independent samples.

for significance using the t-test for independent groups (19); the groups are statistically equivalent on these three measures.

Pretest medians and composite rank orders for values for experimental and control groups are presented in Tables 2 and 3. Due to the nonparametric nature of the data from the Value Survey, the Median Test for k-related Groups (15) was used to test for pretest differences. Seven values differentiate significantly between experimental and control subjects. This is not considered a methodological problem, however; pretest equivalence between groups is not essential to the study, since we are investigating differential treatment effects.

Change analyses. Table 4 shows F, D, and Mach change means for experimental and control groups. Change means were tested using the t-test for correlated measures (19). Experimental subjects

TABLE 2.—PRETEST TERMINAL VALUE MEDIANS AND COMPOSITE RANK ORDERS FOR EXPERIMENTAL AND CONTROL GROUPS

Value	Control N = 56 Median	Rank	Experimental N = 117 Median	Rank	Median Test X^2
A comfortable life	13.90	(14)	12.92	(14)	0.42
An exciting life	12.70	(13)	12.44	(12)	0.03
A sense of accomplishment	7.10	(6)	5.42	(1)	1.66
A world at peace	8.83	(11)	5.75	(2)	1.37
A world of beauty	11.50	(12)	12.88	(13)	1.09
Equality	7.83	(7)	7.44	(7)	0.26
Family security	5.70	(2)	9.20	(11)	2.33
Freedom	7.90	(8)	5.81	(3)	4.17*
Happiness	6.50	(5)	5.94	(4)	0.10
Inner harmony	4.79	(1)	7.20	(6)	3.05
Mature love	8.25	(10)	8.80	(10)	0.00
National security	16.17	(18)	15.35	(17)	1.62
Pleasure	14.63	(16)	14.13	(16)	0.28
Salvation	15.00	(17)	15.69	(18)	0.19
Self-respect	5.90	(3)	6.44	(5)	0.20
Social recognition	14.17	(15)	13.82	(15)	0.17
True friendship	6.33	(4)	7.67	(9)	0.73
Wisdom	8.10	(9)	7.63	(8)	0.01

*p<.05

TABLE 3.—PRETEST INSTRUMENTAL VALUE MEDIANS AND COMPOSITE RANK ORDERS FOR EXPERIMENTAL AND CONTROL GROUPS

Value	Control N = 56		Experimental N = 117		Median Test X^2
	Median	Rank	Median	Rank	
Ambitious	9.50	(9)	6.60	(4)	4.65*
Broadminded	6.00	(4)	5.25	(2)	0.09
Capable	8.90	(7)	8.56	(10)	0.00
Cheerful	10.50	(12)	8.42	(7)	1.13
Clean	15.21	(17)	14.25	(17)	0.09
Courageous	10.21	(10)	12.38	(14)	4.49*
Forgiving	5.30	(3)	7.86	(5)	5.69*
Helpful	6.64	(5)	8.54	(8)	3.01
Honest	4.17	(1)	4.95	(1)	0.13
Imaginative	11.83	(13)	10.44	(12)	0.42
Independent	10.50	(11)	8.59	(11)	5.61*
Intellectual	13.50	(16)	11.89	(13)	0.41
Logical	12.50	(14)	12.42	(15)	0.01
Loving	4.25	(2)	8.00	(6)	4.35*
Obedient	16.60	(18)	16.36	(18)	0.10
Polite	13.39	(15)	13.65	(16)	0.51
Responsible	6.90	(6)	5.63	(3)	4.64*
Self-controlled	9.00	(8)	8.56	(9)	0.27

*$p<.05$

changed significantly on both F and Mach; neither group changed significantly on D.

Tables 5 and 6 show value change data for experimental and control group subjects. Experimental subjects changed downward significantly (deemphasized) on the following values: *a sense of accomplishment, equality, ambitious*, and *capable*. One value—*true friendship*—increased in relative importance. Only one value—*obedient*—changed significantly for the control subjects.

Using the Fisher Exact Probability test (16) we find that the difference between experimental and control groups in the number of value changes observed is significant beyond the .001 level.

TABLE 4.—AUTHORITARIANISM (F), MACHIAVELLIANISM (MACH), AND DOGMATISM (D) CHANGES FOR EXPERIMENTAL AND CONTROL GROUPS

		N	Pretest $\bar{x}$	Pretest s.d.	Posttest $\bar{x}$	Posttest s.d.	Change $\bar{x}$	p[1]
F	Experimental	102	35.83	8.35	37.70	8.41	+1.87	<.02
	Control	49	37.59	9.18	37.49	8.29	−.10	ns
Mach	Experimental	103	89.00	12.18	93.00	13.53	+4.00	<.001
	Control	48	85.85	14.27	88.59	13.44	+2.74	ns
D	Experimental	103	66.21	12.52	66.05	11.69	−.16	ns
	Control	48	64.04	12.20	64.92	12.10	+.88	ns

[1] t-test for correlated measures.

TABLE 5.—MEAN CHANGES IN TERMINAL VALUES FOR EXPERIMENTAL AND CONTROL GROUPS

Value	Experimental N = 104	Control N = 49
A comfortable life	.10	−.35
An exciting life	.71	−.92
A sense of accomplishment	−1.18*	−1.12
A world at peace	−.59	.88
A world of beauty	.52	.04
Equality	−1.07*	−.26
Family security	−.28	−.10
Freedom	−.29	.78
Happiness	.11	−.02
Inner harmony	.71	1.14
Mature love	.08	−.51
National security	−.49	.47
Pleasure	.45	.37
Salvation	.72	.37
Self-respect	.54	.06
Social recognition	−.45	−.49
True friendship	.89**	−.04
Wisdom	−.48	−.29

*p<.05
**p<.01 t-test for correlated measures.

TABLE 6.—MEAN CHANGES IN INSTRUMENTAL VALUES FOR EXPERIMENTAL AND CONTROL GROUPS

Value	Experimental N = 100	Control N = 49
Ambitious	−.98*	.04
Broadminded	−.22	.88
Capable	−1.31*	−.35
Cheerful	.06	.04
Clean	−.69	−.14
Courageous	.87	−.33
Forgiving	.01	−.29
Helpful	−.10	−1.18
Honest	.10	.61
Imaginative	.11	−.33
Independent	.64	.18
Intellectual	.31	.65
Logical	.18	.06
Loving	.79	−1.29
Obedient	.29	1.57*
Polite	.32	.31
Responsible	−.68	−.08
Self-controlled	.30	−.37

*p<.05.
**p<.01 t-test for correlated measures.

DISCUSSION AND CONCLUSIONS

The present research was designed to study belief system changes in student teachers through the use of social psychological measures. This approach has proved useful, since the changes observed seem to fit an intuitively logical pattern. Student teachers were significantly more authoritarian and more Machiavellian at the end of the 16-week student teaching experience. Their values changed in such a way as to indicate a deemphasis of personal competency-type values (*a sense of accomplishment, ambitious, capable*) which, when considered in conjunction with F and Mach findings, suggest that the student teachers' belief systems changed in a direction that most educators would probably deem undesirable.

The upward change in authoritarianism is particularly interesting in view of the comment made by Cook and others (4) suggesting that

the authoritarian personality syndrome is a good operational definition of the "poor teacher." The findings of this study indicate that the student teaching experience tends to increase the level of authoritarianism in student teachers. Does this indict student teaching programs, or does it suggest that student teachers are unprepared to handle the classroom and therefore turn to authoritarian methods in order to gain control?

How should we interpret the findings concerning Machiavellianism? Christie and Geis (3) warn against the usual pejorative connotations surrounding the term *Machiavellian*. Even so, two factors of the Mach personality—aloofness in interpersonal relationships and lack of concern with morality—should at least create concern among educators. Does the increase in Mach among the student teachers in this study carry favorable or unfavorable connotations? On the one hand, we might explain these data as resulting from the realization by the student teachers that the classroom teacher is essentially a manipulator and that his job demands Machiavellian tactics. On the other hand, we might also reasonably infer that the student teaching experience forces the students into a cool, aloof, amoral frame of mind.

Interestingly, the supervising teachers in this study—those to whom the student teachers were assigned—were, as a group, significantly less authoritarian, less Machiavellian, and more open-minded than the student teachers. Does this suggest that the increases in F and Mach reported here are simply temporary defense mechanisms erected by the student teachers in response to the new situation they are confronting?

Dogmatism scores remained unchanged for the student teachers over the 16-week period. In light of the fact that open-mindedness has long been a purported goal of the teaching profession, does this imply that the student teaching experience should be modified so as to induce open-mindedness if possible?

Finally, how should we interpret the value-change data? Homant and Rokeach (5) found that expressed rankings of values may correlate negatively with implied behavior (e.g., the value *honest*, and cheating), thus suggesting some type of needs expression. Other values (10) are related positively to logically related behavior (e.g., the value *equality*, and civil rights activities). It would seem, however, that an actual decrease in ranking of a particular value would imply a lessening of relative importance, regardless of the initial ranking.

What meaning should we ascribe to the deemphasis of personal competency values? It would be nice to say that as a result of their

first exposure to actual teaching the student teachers in our study became less achievement-oriented and more concerned with the problems of their students. Somehow, when considered along with the F and Mach data, this conclusion seems inconsistent and implausible.

A more reasonable explanation would suggest that the student teachers came into the teaching experience in an idealistic state of mind, highly motivated and altruistic, burgeoning with the promise of a teaching career. At first they attempted to be democratic and tried to suggest ideas in the classroom rather than force them upon their students. Gradually, they became frustrated and turned to more authoritarian and manipulative tactics. They found that these tactics worked, but at the cost of their own identity.

It would appear that the effects, if not the intent, of Central Michigan University's student teaching experience are to graduate competency-based rather than affectively trained teachers. Are these two approaches mutually exclusive? Is it possible to design a teacher training program conducive to graduating teachers that are both achievement-oriented and sensitive to personal problems, or is this combination only a fortunate accident in a few teachers?

In summary, we feel that we have presented a beneficial and viable alternative approach to studying the teacher education process. As stated earlier, this research is only a preliminary investigation, attempting to recommend areas of concern for educators and researchers alike. We hope we have raised many more questions than we have answered, and our findings should stimulate other researchers to study the changes in belief systems of student teachers in much greater depth and detail.

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ASSESSING A TEACHER EDUCATION PROGRAM

Introduction

Few teacher education programs have been planned on the basis of student needs. They have instead been based on what those involved in teacher education have thought to be best for students. Professors, administrators, state departments of education, and others have used an eclectic approach to program planning which has resulted in programs often far removed from student needs. Today much effort is being expended in revision and development of teacher education programs. Most of these efforts, though generously supported by federal and state agencies, have still neglected to adequately determine students needs. If teacher education programs are to prepare teachers effectively, then it is necessary to determine prospective teacher concerns through research and to revise or develop programs to meet these needs.

This study was devised for the purpose of ascertaining the needs perceived by prospective teachers. The results reported are based on data obtained from 711 student teachers who had just completed the four-year program. The instrument used to gather the data had previously been used in conjunction with beginning teachers (6). Changes incorporated in the instrument provided additional data in conjunction with the proposed standards for accreditation by the National Council for Accreditation of Teacher Education (NCATE) and resulted in a 159-item questionnaire that yielded information in four major areas : choice of vocation, teacher preparation program, student teaching experience, and suggested improvements (1).

Choice of Vocation

This area was explored through examining external and internal factors that influenced students' decisions to teach. Sixty-two percent of the students indicated that it was their own decision as opposed to someone else's suggestion, and that the decision was made during high school or the first two years of college. Thirty-one elementary education students indicated that this decision was influenced by the inspiration of an elementary teacher. A similar number of secondary education students indicated that the suggestion of a high school teacher influenced their choice.

Table 1 indicates which internal factors influenced students' career decisions. The selection of the item most important was not as clearly differentiated as with the external factors. Chi square was used to distinguish among the three groups[1]. A significant number of elementary education students indicated a career of teaching based on a desire to work with children. Secondary education students differed significantly from the other groups in their expressed desire to contribute to society. Many of today's youth appear to view teaching as a means to improve society.

TABLE 1—INTERNAL FACTORS AFFECTING CAREER CHOICE

Factors	Elementary N = 309	Secondary N = 205	Special Fields N = 192
A Subject matter interest	6	48	53
B Desire to work with children	197[a]	43	41
C Excellent femine career	51	42	34
D Desire to contribute to society	45	47[b]	28
E Other	6	19	23

[a] El.–Sec. $X^2 = 90.61$, significant at .01 level; X^2 required at .01 = 6.64.
El.–Spec. $X^2 = 85.37$, significant at .01 level.

[b] El.–Sec. $X^2 = 5.87$, significant at .05 level; X^2 required at .05 = 3.84.
Sec.–Spec. $X^2 = 4.50$, significant at .05 level.

Teacher Preparation Program

There was concern not only with the reasons given for entering programs leading to teaching certification but also for the quality of the program itself. Students were asked to rate their satisfaction with the program in six vital dimensions. A rating scale of "very unsatisfactory–unsatisfactory–neither satisfactory nor unsatisfactory–satisfactory–very satisfactory" was used. The "satisfactory" and "very satisfactory" responses were grouped and designated as high; the others were grouped as low. The assessment was divided into six general areas:

1. Your teaching personality
2. Your general knowledge and understanding

[1] These Groups include the following: elementary includes primary (K-3) and elementary (4-7); secondary includes English, French, German, Latin, mathematics, social studies, and Spanish; and special subjects include agriculture, art (elementary and/or secondary), business, distributive, health and physical education (men), recreation (women), speech correction, and special education.

3. Your ability to use the English language effectively
4. Your knowledge and understanding of the subject areas in which you teach
5. Your understanding of children and youth
6. Your understanding of the nature of the learning process.

In the first four areas, using chi square, there were no significant differences and responses indicated a general satisfaction among students with their preparation. The positive direction of responses in the other areas suggests that students felt reasonably competent. The figures, however, have greater meaning if they are divided among the elementary, secondary, and special subject majors. Tables 2A and 2B indicate this breakdown and the high and low ratings in areas 5 and 6.

TABLE 2A.—SATISFACTION WITH UNDERSTANDINGS OF CHILDREN AND YOUTH

Understanding	Elementary		Secondary		Special Subjects	
	Low	High	Low	High	Low	High
Insight into causes of behavior	(45	263)[a]	55	150	54	146
Skill and work with exceptional children, the bright, the dull and the handicapped	101	206	(120	85)[b]	77	113
Skill in group work	65	239	(81	122)[c]	56	134
Skill in maintaining discipline	111	187	82	113	57	122

[a] El.–Sec. $X^2 = 11.71$, significant at .01 level; X^2 required at .01 = 6.64.
El.–Spec. $X^2 = 11.86$, significant at .01 level.

[b] El.–Sec. $X^2 = 32.93$, significant at .01 level; X^2 required at .10 = 6.64.
Sec.–Spec. $X^2 = 12.80$, significant at .01 level.

[c] El.–Sec. $X^2 = 20.36$, significant at .01 level; X^2 required at .01 = 6.64.
El.–Spec. $X^2 = 4.14$, significant at .05 level; X^2 required at .05 = 3.84.
Sec.–Spec. $X^2 = 4.70$, significant at .05 level.

Table 2A shows that a significant number of secondary and special subject students, as opposed to elementary, expressed dissatisfaction with their insight into causes of behavior. This difference might be explained by the requirements of elementary students to take a child development course and to engage in more extensive field experiences in a public school classroom setting.

A significant number of secondary students were dissatisfied with their preparation for working with exceptional children. Nearly 50 percent of the elementary students and nearly 41 percent of the special students felt this same lack of preparation. More secondary students also felt significant dissatisfaction with their acquired skill in using group work, as opposed to the elementary and special field students.

While there were no differences among groups in the area of maintaining discipline, it is interesting to note that 63 percent of all students felt adequately prepared.

TABLE 2B.—SATISFACTION WITH UNDERSTANDINGS OF THE NATURE OF THE LEARNING PROCESSES

Understandings	Elementary		Secondary		Special Subjects	
	Low	High	Low	High	Low	High
Skill in helping pupils determine objectives	66	243	78	126	43	148
Skill in motivating pupils	40	268	(60	143)[a]	35	156
Skill in pupil-teacher planning	47	161	58	143	39	151
Skill in using a variety of teaching methods	(27	281)[b]	36	169	37	154
Skill in evaluating pupils	58	250	62	141	44	143
Ability to use teaching materials	27	272	36	162	26	160

[a] El.–Sec. $X^2 = 21.34$, significant at .01 level; X^2 required at .01 = 6.64.
Sec.–Spec. $X^2 = 6.79$, significant at .01 level.

[b] El.–Spec. $X^2 = 8.84$, significant at .01 level; X^2 required at .01 = 6.64.
El.–Spec. $X^2 = 11.86$, significant at .01 level.

In Table 2B it is apparent that most students felt well-satisifed with their ability to help pupils develop objectives, to evaluate pupils, and to use teaching materials effectively. While there was general satisfaction in regard to the ability to motivate students, a significant number of secondary students as opposed to the other groups indicated a lack of understanding. A significant number of

elementary students expressed strength in the ability to use a variety of teaching methods. This may have been due to the breadth of methods courses and number of different instructors that are provided for elementary students.

In regard to the evaluation of courses in teacher preparation, students responded as shown in Table 3, which identifies several areas of particular concern. Students generally viewed the introduction to education course as being unsatisfactory. Many students viewed their educational psychology and curriculum planning courses in a similar fashion. It would appear that major revision of these two course offerings might be particularly beneficial. Directions for change to more practical and field experience oriented courses are suggested in later data from this study.

TABLE 3.—EVALUATION OF SELECTED TEACHER EDUCATION COURSES

Courses	Elementary		Secondary		Special Subjects	
	Low	High	Low	High	Low	High
Introduction to education	194	113	133	61	101	88
Educational psychology	109	197	98	105	80	110
Other psychology courses	98	204	80	114	79	97
Curriculum planning	107	200	101	100	67	114
Teaching procedures	68	196	54	148	40	148
Student teaching	17	292	24	177	26	164

Approximately two-thirds of the students in all groups viewed their teaching procedures course as satisfactory. Student teaching was seen as being most satisfactory, with over 98 percent of all students giving it a high rating.

While the above results have been hypothesized, it is no credit to a teacher education program that in several educational areas many students, upon reflection, believe that their needs have not been recognized or fulfilled.

Student Teaching Experience

Most students perceived the student teaching experience as satisfactory and the vast majority found the general attitude of

teachers in their schools to be friendly. When asked if they encountered any conflict between the ideas and philosophies they had formed in college and those of other teachers in their school, 230 responded "none," 402 "some," 54 "much," and 17 "don't know." These data support the theory that teacher education institutions tend to be idealistic in their approach.

Students were asked to identify the amount of help received in certain specific aspects of professional development while student teaching. The results are shown in Table 4. Elementary students perceived more help in developing better personal qualities and in understanding the use of special school services. Secondary students

TABLE 4.—HELP RECEIVED IN PROFESSIONAL DEVELOPMENT WHILE STUDENT TEACHING

Categories	Elementary N = 309		Secondary N = 208		Special Subjects N = 192	
	None	Some or Much	None	Some or Much	None	Some or Much
Developing better personal qualities as a teacher (poise, emotional control, etc.)	28	279	38	164	34	156
Understanding in using special school services (standarized test results, remedial reading, psychologists, etc.)	61	246	92	112	73	117
Understanding and using courses of study and curriculum guides	54	252	47	155	48	136
Planning for and working with gifted and retarded children	124	182	108	95	79	108
Getting acquainted with the community and people	62	246	67	136	38	150
Understanding extracurricular activities	55	251	42	158	39	147

perceived less help in planning for and working with gifted and retarded children and also in getting acquainted with the community and its people.

In an effort to discern from students their representation of the greatest areas of concern and anxiety during student teaching, students were asked to respond to thirteen items. The four areas in which the most concern was expressed are shown in Table 5. All the groups expressed a similar degree of concern about the four areas. Helping students become interested in learning posed the greatest problem, and it may logically follow that disciplinary problems would also be evident. It is interesting to note that in special subject fields, where the emphasis is simply on skill development, a large number of students found it difficult to plan learning activities with their pupils. The relationship between evaluation and the planning of learning activities suggests that there is a need to provide greater assistance in these areas. Perhaps the trend to the use of behavioral objectives in the classroom will provide a solution.

TABLE 5.—SOME PROFESSIONAL ACTIVITIES THAT CREATED ANXIETY DURING STUDENT TEACHING

Activities	Elementary		Secondary		Special Subjects	
	None	Some or Much	None	Some or Much	None	Some or Much
Handling disciplinary problems	39	267	39	163	43	142
Motivating pupils that seem disinterested	28	277	14	186	27	160
Planning learning activities with students	79	226	25	177	49	135
Evaluating pupil progress	49	258	20	182	36	149

Table 6 shows the responses from students regarding the effectiveness of supervisors in working with student teachers. Again, chi square was used to analyze the results. The data indicate that student teachers generally believed that the supervision they received from both college and public school personnel was effective. However, 162 individuals did not feel effectively supervised. A significant number of elementary student teachers viewed the effectiveness of the

college supervisor as low, as opposed to secondary students. (A follow-up study on this would be desirable.) This also was true in regard to the effectiveness of college and public school elementary supervisors in working together.

TABLE 6.—EFFECTIVENESS OF SUPERVISORS

	Elementary		Secondary		Special Subjects	
	Low	High	Low	High	Low	High
College supervisors	(52	253)[a]	13	190	22	167
Supervising teachers	41	266	18	185	16	172
Effectiveness of college supervisors and supervising teachers in working together	(77	277)[b]	19	184	11	176

[a] El.–Sec. $X^2 = 12.38$, significant at .01 level; X^2 required at .01 = 6.64.

[b] El.–Sec. $X^2 = 13.89$, significant at .01 level.

The need for improvement in the selection and training of supervisors was further supported by additional data from students regarding the interest of the supervising teachers in helping them become competent professionals. Twenty-seven of the respondents indicated that their supervising teacher showed little such concern, and an additional twenty-seven were unable to say whether such concern existed. While this does not represent a large percentage of the total, it nevertheless deserves attention because a helping relationship on behalf of a supervising teacher is a crucial aspect of successful student teaching, which in this case did affect fifty-four individuals.

Suggested Improvements

Suggestions for program change are shown in rank order in Table 7. It is evident from the first three items that students desire earlier and more extensive field experiences, with greater emphasis on practical teaching methods and techniques for dealing with specific problems. While the other items relate to the overall preparation of students, it appears that they would have to be examined and considered more completely by individual departments since the implications are not conclusive for all students.

TABLE 7.—RANK ORDER SUGGESTIONS FOR IMPROVING TEACHER EDUCATION PROGRAMS

Suggestions	Elementary		Secondary		Special Subject	
	Rank	N	Rank	N	Rank	N
More practical methods, more practical courses	1	(171)	2	(90)	1	(84)
Develop more specific helps	2	(141)	1	(91)	2	(70)
Introduce professional work earlier	3	(118)	4	(67)	3	(56)
More specialization	4	(85)	6	(50)	7	(39)
Improve quality of college teaching	5	(85)	8	(45)	8	(33)
More practical experience in student teaching instead of clerical work	6	(78)	5	(51)	4	(56)
More emphasis on understanding children	7	(73)	7	(46)	5	(55)
More emphasis on subjects in major fields	8	(56)	3	(81)	6	(40)

Conclusions and Implications

The purpose of this study was to assess the quality of a teacher education program by having graduating students indicate their perception of its various aspects. The conclusions relate specifically to one institution. However, there is similarity among many teacher education programs, suggesting that the conclusions may well be applicable to other institutions. The implications which can be drawn from the data suggest that changes are desirable in several components of the teacher education program.

It seems clear that colleges ought to plan to identify those students who have made an early choice of a teaching career. From such identification involvement in becoming a teacher could be planned even at the freshman level. A close relationship with the public schools could help in a supportive effort to introduce high school students into teaching experiences through teacher aide, tutorial, and assistant teacher activities. More than half of the

students in this study indicated that their teaching career choice was made prior to their junior year in college. It would seem expedient to take advantage of the early interest of such individuals, particularly when so many teacher education programs are being expanded to include greater development in competencies, abilities, and understandings.

One major finding derived from the data which is rarely capitalized on is that most of today's students have a conscious and substantial desire to work for the improvement of society through working with youngsters. This altruistic commitment should be recognized and nurtured by a greater emphasis on humanistic means of teaching. The Association for Supervision and Curriculum Development yearbook of a decade ago portrayed humanistic approaches to teaching which involve development of the self-concept, concern for individual differences, and assurance of success on the part of students (5). But even today few teacher training programs provide an emphasis for prospective teachers in these areas.

From the low value students placed on their introductory course to education it is evident that some adjustments are required. Students have suggested that more attention be given to specific problems and the relationship between practice and theory. It would seem that with the addition of field experiences and a concern for earlier and more humanistic approaches to teaching, these campus courses, as such, could be eliminated. Such a change would relate the immediate needs of students to the skills and understandings necessary for teaching.

While most students seem to be satisfied with their preparation in some of the basic classroom skills, such as discipline, motivation, and planning with students, they nonetheless indicated a great concern for these things during student teaching. It is interesting to note that Anderson (2) and Triplett (7), in earlier studies, found similar concerns among student teachers in different parts of the country. A survey just concluded at the institution where the initial study was made indicates that these concerns still prevail. It may well be that these concerns cannot be fully ameliorated by any preservice program and the most that can be accomplished is the development of an awareness of the problems. Early field experiences which are planned to focus on these problem areas can introduce the reality that there is no panacea for resolving them but that all good teachers have similar concerns and work toward individual solutions in their own situations.

Those who have been involved in teacher education have considered student teaching as the most valuable component. That

concept is supported by this study. However, there is evidence that student teaching could be strengthened. While some institutions have abandoned their supervisory function, allowing students to select their own student teaching situations and relying on public school personnel for supervisory services, others are placing greater emphasis on supervision through the development of teacher education centers and internships. This study tends to support the notion that supervision ought to be strengthened rather than abandoned.

Approximately 20 percent of the students in this study felt that they were ineffectively supervised during student teaching. It is incumbent upon the teacher training institution to identify supervisory skills that need to be strengthened and to provide means whereby supervisors may become more proficient in working with student teachers. Rather than using established criteria such as those found in the Association for Student Teaching position papers (3,4) or those recommended by a state department of education, it would be more helpful for institutions to modify their criteria on the basis of data gathered from their own student teachers. For the institution where this study was conducted, these criteria would certainly include the identification of supervisors who have a genuine concern for the development of professionals and those who could offer substantial assistance in specific problem areas.

The wealth of useful data obtained from students in this study suggests that it is imperative that every teacher education institution obtain student views of its program on a continuing basis. Such views could provide a focus for program change.

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A STUDY OF THE VERBAL BEHAVIOR OF CREATIVE AND LESS CREATIVE ENGLISH AND SOCIAL STUDIES STUDENT TEACHERS

Introduction

Critics of education have repeatedly expressed their concern about the lack of creative teaching behavior in American public schools. Charles Silberman, in *Crisis in the Classroom*, characterized the climate of many of the thousand classrooms he visited as mutilating—"with mutilation of spontaneity, of joy of learning, of pleasure in creativity, of sense of self."[1] Such an indictment is not surprising when one considers, as Torrance and Myers did in *Creative Learning and Teaching*, that the public and the profession rarely think of teachers as particularly creative people.[2] However, teachers need to behave in a manner characteristic of the creative person—with flexibility, spontaneity, originality, and sensitivity—if they are going to be effective.

Certainly such criticism leveled at the profession indicates the necessity for the profession to use self-examination in order to explore and develop its creative nature. Questions such as who are creative teachers, what do they do differently in the classroom (if anything), and what effect does their verbal behavior have on their students need to be studied to facilitate teachers in developing a flexibility in teaching behaviors that would encourage their own as well as their students' creative talents.

A survey of the literature revealed that no research dealing with a specific analysis of creative and less creative student teachers in English and social studies was available. In addition, little mention was made of creative teaching on the secondary level. The emphasis of research and related literature on creativity in the elementary grades indicated a need to examine the secondary teacher more carefully in order to gain an understanding of how creativity can be expressed in a structured content area. This led the researcher to question the likelihood of student teachers who ranked high or low on a creativity test being able to manifest their potential or the absence of it in student teaching given the lack of emphasis on

[1] Silberman, Charles E. *Crisis in the Classroom*. New York: Random House, 1970. p. 10.

[2] Torrance, E. Paul, and Myers, R. E. *Creative Learning and Teaching*. New York: Dodd Mead and Co., 1970. pp. 2-3.

creative teaching skills in their preparation and practice. Since mainly the verbal behavior of the teacher establishes the climate of the classroom, and since the literature on creativity and the classroom indicates that a creative person needs a certain climate in order to function well—a climate with open-ended experiences and open-ended programs—the task was structured to ascertain the following information : (a) the differences in verbal behavior between student teachers rated creative and those rated less creative, (b) differences in pupils' verbal initiative and response to these two groups, (c) differences in learning activities employed by the two groups, and (d) differences in selected personal and professional characteristics between the two groups.

Definition

In this report creativity has been regarded as a mental process capable of being measured and composed—in Guilford's terms, from his "Structure of the Intellect Model"—of *divergent production* behavior and transformational ability. Divergent production refers to *fluency*—use of stored information, and *elaboration*—the process of one thought leading to another. Transformation ability means alternate uses: *originality*—the ability to form the new and different, and *flexibility*—the ability to produce new forms and patterns.[3] Thus Guilford has broken down his two major categories into the intellectual behaviors operating in the four cognitive areas of *fluency*, *flexibility*, *originality*, and *elaborative* thinking. These four creative behaviors are the behaviors tested in the Torrance Tests of Creative Thinking, Figural and Verbal, used to select the two groups of student teachers.

The *creative* group of student teachers were those who received the highest scores on the Torrance Tests of Creative Thinking, with a group range of 95 points.

The *less creative* group of student teachers were those who received the lowest scores on the Torrance Tests of Creative Thinking, with a group range of 115 points.

The verbal behavior of the student teachers (their talk during the teaching of the lesson) was measured by use of the Flanders Interaction Analysis Categories with the addition of the Aschner-Gallagher Categories to classify the types of questions asked, the responses given, and talk initiated by the students. The Aschner-Gallagher Categories of four types of thinking include the following : *cognitive memory*—reproduction of material through use of recogni-

[3] Guilford, J. P. "Structure of Intellect." *Psychological Bulletin* 53:269-70; 1956.

tion, rote memory, and recall; *convergent*—the analysis and integration of given or remembered data that leads to one best answer; *divergent*—production of thinking and questioning that leads off in different directions, is open-ended, allows freedom to generate own data, take a new direction; *evaluative*—the utilization of judgment in dealing with matters of value rather than fact.

The Flanders Interaction Analysis Categories with subscripts, used in this study to classify the verbal behavior every five seconds during the observation sessions, appeared as follows:

Teacher Talk	01—accepts feeling and identifies it
	02—uses praise
	03—uses positively students' ideas
	04—accepts answers of student taken from text
	05—asks questions without a particular cognitive level
	06—asks cognitive memory questions
	07—asks convergent questions
	08—asks divergent questions
	09—asks evaluative questions
	10—asks question reading from text
	11—lectures—includes expressing opinion, thoughts
	12—gives directions
	13—criticizes or justifies authority
Student Talk	14—answers on cognitive memory level
	15—answers on convergent level
	16—answers question using the text
	17—initiates talk on cognitive memory level
	18—initiates talk on convergent level
	19—initiates talk on divergent level
	20—initiates talk on evaluative level
	21—asks directions
Silence or Noise	22—silence
	23—study period
	24—constructive period (noise from purposeful class activity)
	25—disruptive confusion (disrupts class proceedings)
	26—any other happening.

Methodology

Thirty-nine English and social studies student teachers entering their student teaching practicum in the fall of 1971 were administered the Torrance Tests of Creative Thinking. The nine student teachers scoring the top composite T-scores, ranging from 584 to

489, were considered the creative group; and the ten student teachers making the lowest scores, ranging from 390 to 275, were named the less creative group.

These nineteen student teachers were not informed as to their scores on the creativity tests, nor were their supervisors. The two groups engaged in their teaching experiences not realizing that they were the subjects of a research project. Their supervisors recorded the verbal behavior in five classroom sessions of 30 minutes duration in a seven-week period for each student teacher using the expanded Flanders instrument. Verbal behavior was coded every five seconds. The two supervisors previously had trained for two weeks and had reached a Scott coefficient of 0.87 for interrator agreement.

In addition, the classroom activities used by the student teachers during the five observations were recorded and checked against those activites included on the Torrance Creativity List. If the activities were similar in nature to those on the list or appeared original and innovative to the supervisors, they were considered creative. The rationale for recording class activities was to obtain a further check on the operation of the creative process as it applied to the student teachers' planning through noting the number and kinds of activities they used demanding originality, flexibility, and divergency.

Subjects also completed a questionnaire pertaining to family background and high school and college activities. The university evaluation sheets completed by the campus supervisors were studied as well to observe possible differences in the personality assessment and professional assessment between the creative and less creative groups. Such data were obtained to build as complete a picture as possible of the two subject groups through data collections on personality, process, press (interaction between people and their environment), and product.

Within the descriptive analysis, simple statistical procedures in the form of category frequencies, percentage distributions, and ratios were used to interpret and analyze the data. Ratios were computed for indirect/direct (*i/d*) ratio, teacher question ratio, pupil initiated response ratio, student talk to teacher talk ratio, pupil divergent talk ratio, and teacher divergent question ratio. A *fluency* rate was obtained for each individual by dividing categories 5 through 11 on the expanded Flanders by categories 1 through 13. The *flexibility* rate was determined by noting the changes in the student teachers' *i/d* ratio over the five observation sessions and the number of different activities used. *Originality* scores resulted from totals of categories 8 and 9 divided by categories 5 through 9, plus the number of class activities used that were similar to those on the

Torrance Creativity List. *Elaboration* scores were obtained by a frequency comparison of the use of categories 3 and 11 in combination.

The data accumulated was to present a descriptive study of the behavior of creative and less creative student teachers in order to better understand the behavior of the creative teacher and how such behavior might be cultivated in all teachers.

Findings

The creative student teachers were observed as displaying certain behaviors to a greater extent than were the less creative; however, the differences were not expressed in large percentages. The creative group exhibited 10 percent more indirect behavior than did the less creative while using 21 percent of teacher talk time for questions as compared to 15 percent for the less creative. (See Table 1.)

TABLE 1.—GROUP PERCENTAGES OF SPECIFIC INDIRECT TEACHER BEHAVIOR

Behavior	Creative Group	Less Creative Group
Accepting pupils' feelings	0	0
Praising or encouraging	3	2
Accepting pupils' ideas	10	7
Asking questions	21	15
Total indirect behavior	34	24
Total direct behavior	66	76

The creative student teachers asked more convergent questions and divergent-type questions while the less creative asked more cognitive memory questions. (See Table 2.) The convergent question demands more of the pupil by requiring him to put facts together to arrive at an expected answer. The divergent question encourages an open-ended response, allowing the student to use his own ideas, thus encouraging creativity. Divergent behavior is one of the characteristics of creative behavior as defined in this study.

In the area of pupil talk, concerned with pupil talk solicited by the teacher and pupil talk initiated by the students, one of the most substantial differences in behavior between the two groups is revealed. The creative group had 42 percent pupil talk in contrast to 28 percent for the less creative group. Considering that more cognitively complex questions were asked by the creative student

TABLE 2.—GROUP PERCENTAGES OF SPECIFIC TYPES OF QUESTIONS ASKED

Type of Question	Creative Group	Less Creative Group
Routine	8	11
Cognitive memory	44	61
Convergent	25	13
Divergent	16	10
Evaluative	6	2
Text questions	1	3

teachers in their greater use of convergent and divergent questions, this difference in percentages is understandable.

Self-initiated talk is considered an important feature of the creative classroom, and the creative teacher strives to maintain a climate that encourages pupil initiative. Therefore, it would be expected that the creative student teachers would have a higher percentage of pupil initiated behavior. The findings support this assumption, showing that the creative group totaled 10 percent more pupil initiated talk than did the less creative group (See Table 3).

TABLE 3.—GROUP PERCENTAGES OF SPECIFIC PUPIL TALK DURING OBSERVATIONS

Kind of Pupil Talk	Creative Group	Less Creative Group
Pupil response	37	47
Pupil initiation	63	53

Viewing the frequency tabulations through previously named ratios highlighted group differences in the student/teacher talk ratio, the pupil divergent talk ratio, and the teacher divergent question ratio. The student/teacher talk ratio showed the creative group allowing their pupils to talk in more of the class time than the less creative, with a ratio of 42 to 28.

More pupil divergent talk in total pupil talk time occurred with the creative groups. The pupil divergent talk ratio was 40 to 28. This talk was initiated by a teacher divergent question ratio of 21 for the creative as compared to 12 for the less creative.

When examining the four creativity factors isolated in the Torrance Tests of Creative Thinking in the behavior of the two

groups, the greatest difference was found in the flexibility scores. Flexibility was observed by studying the changes in each individual's indirect/direct ratio over the five observation sessions, plus considering the number of different class activities each used. The mean for the flexibility scores was higher by 10.62 points for creative group, indicating that they had larger ranges of *i/d* ratios for more individuals than did the less creative group. One example of the flexibility revealed by the *i/d* ratio from 1.67 (slightly over one indirect behavior for each direct behavior exhibited in an observation period) to a 58.00 ratio for another period.

A perusal of the variety of class activities each group used revealed that the creative group did employ a greater number of varying class activities during the five observed sessions.

As might be expected, the creative group also used more activities from the Torrance List of Creative Activities. The number of creative activities used plus the amount of divergent and evaluative questions recorded comprise the rating for the *originality factor*. The creative group obtained a total of 22 percent as compared to 13 percent for the less creative, thus giving some indication of more evidences of originality in the creative group's behavior.

The creative group's activities were generally more open-ended, encouraging divergent production, greater individual participation in the lesson, more emphasis on self-initiated learning. Some of the varied methods observed in this group included the establishment of a learning center in the room, equipped with five filmstrip projectors; map work; and role-playing enactments. Another method involved the teacher's remaining silent and directing a discussion only with nonverbal behavior, encouraging the students with his gestures to contribute, elaborate, or criticize.

A scrutiny of the evaluation sheets completed by the university supervisors (who still were uninformed about the creative standings of their student teachers) revealed that all the creative student teachers except one received an A. Four of the ten less creative student teachers were rated A. Over half of the less creative group were evaluated as less successful in the student teaching experience because of a deficiency in three areas considered characteristic of creative individuals—high energy, resourcefulness, and a creative approach to the learning experience. Interestingly, the college grade point average was higher for the less creative group.

Of interest from this area of the study is the creative group's strong indication on the personal questionnaire of their parents' influence in developing their creativity. This influence was explained in detail in several responses.

Summary of Findings

The following behaviors were found to be representative of the *creative* group by a 10 percent or more difference in usage between the two groups:

1. Exhibited more indirect behavior
2. Asked more convergent questions
3. Asked more divergent questions
4. Exhibited more total pupil talk, more convergent pupil talk, more pupil initiated talk, more divergent pupil talk, and a larger student/teacher talk ratio
5. Exhibited more flexibility
6. Used greater variety of activities and used more activities on the Torrance Creativity List
7. Received more A's in student teaching.

The following behaviors represent ones used 10 percent or more by the *less creative* group than the creative student teachers:

1. Asked many more cognitive memory questions
2. Used more direct behavior
3. Elicited more pupil response than initiated pupil talk
4. Elicited much more pupil response on the cognitive memory level
5. Elicited more routine clarification in pupil talk
6. Elicited more disruptive noise
7. Exhibited more elaborative behavior through the use of categories 3 and 11 in combination
8. Received lower marks on professional evaluative sheets in discipline, implementation of learning experiences, health and vitality, and resourcefulness.

Conclusion

Returning to the four areas in which the student teachers were studied to ascertain differences between creative and less creative, the following conclusions can be stated concerning this group of subjects:

1. Differences in verbal behavior between the creative and less creative student teachers were noted, with the creative group exhibiting more behavior considered conducive to a creative climate, such as more indirect behavior, more use of divergent questions. However, the creative group did not exhibit pronounced differences in creative behavior patterns, including the use of reinforcement, use of student ideas, and extensive divergent behavior. Thus for this group an emphasis on creative

teaching behaviors would have been beneficial to stimulate greater use of them.

2. Differences in pupils' verbal initiative and response to these two groups revealed that the creative group encouraged considerably more pupil talk than did the less creative, with greater use of self-initiated and divergent pupil talk. The pupil verbal behavior of the less creative group was convergent in character, with more pupil response than initiated pupil talk and more response on the cognitive memory level.
3. Differences in learning activities utilized by the two groups revealed that the creative group used more originality and flexibility in their activities. They also used a variety of interaction patterns and a greater number of activities included on the Torrance Creativity List.
4. Differences in selected personal and professional characteristics were evidenced by the less successful student teachers in areas known to be characteristic of the creative personality—less originality, less implementation of learning experiences, less health and vitality, less resourcefulness, plus less discipline. The less creative group experienced more discipline problems. Also, it was learned that grade point average had less effect on success in student teaching than the creativity potential did.

An important point to consider is that the creative potential of the creative student teachers did contribute to their success in student teaching. Also, those student teachers in the less creative group who received A's exhibited more of the creative behaviors than did those receiving lower grades. The factor of creative behavior appears essential for the effective teacher. Thus it is necessary that all teachers, student or veteran, have an understanding of the creative process and specific teaching behaviors and materials they can use to encourage the development of a creative classroom.

Recommendations to be made from this research emphasize that each student teacher should be made aware of the impact of his verbal behavior and classroom activities on his pupils' behavior through the use of some form of a systematic observative instrument. Also, student teachers must be taught creative teaching techniques sometime during their training. The development of the teacher's creative potential cannot be left to chance.

Equally important is the alerting of college and public school educators to the criteria of creative teaching so that they do not stifle creativity through imposition of restrictive school environments.

The results of this study emphasize the importance of preservice training in creative education for all student teachers. Teacher education has no more important task than to prepare creative teachers for a world that depends on creativity for its survival.

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